|  |
| --- |
| APPLICATION FORM |
| Enrolment in the Virtual Power Plant Demonstrations |

Please complete this Application Form using the appropriate Application Guide, and any other documents and information sources mentioned in this document.

The information in this Application Form is not to be altered without the prior written consent of Australian Energy Market Operator Ltd (AEMO).

Rules terms

Terms defined in the National Electricity Rules (*Rules* or NER) have the same meanings in this Application Form unless otherwise specified. Those terms are intended to be identified in this form by italicising them, but failure to italicise such a term does not affect its meaning.

Application Form submission

To submit an enrolment application to AEMO:

* complete this Application Form
* print and sign the form using a written signature[[1]](#footnote-2),
* email a scanned copy including all attachments to the AEMO Registration Team via email to VPPenrolment@aemo.com.au.

Contents

[Application Overview 1](#_Toc50382028)

[Section A. Enrolment Scenario 1](#_Toc50382029)

[Section B. Application Details 2](#_Toc50382030)

[B.1. Applicant details 2](#_Toc50382031)

[B.2. Declaration 3](#_Toc50382032)

[Section C. Contact Details 3](#_Toc50382033)

[C.1. Head office details 3](#_Toc50382034)

[C.2. Personnel contacts 4](#_Toc50382035)

[Section D. VPP Details 4](#_Toc50382036)

[D.1. Description of VPP 4](#_Toc50382037)

[D.2. VPP consortium member details 4](#_Toc50382038)

[D.3. Data and cyber security obligations 5](#_Toc50382039)

[Section E. Information on Market Ancillary Service Loads 5](#_Toc50382040)

[E.1. Ancillary service load identification 5](#_Toc50382041)

[E.2. Market ancillary service information 6](#_Toc50382042)

[Section F. Information on Control Equipment 7](#_Toc50382043)

[F.1. Determination of ancillary services information 7](#_Toc50382044)

[F.2. Controls, communications and telemetry information 7](#_Toc50382045)

[Section G. Terms and Conditions 9](#_Toc50382046)

[Section H. IT Systems 11](#_Toc50382047)

[H.1. IT Notifications email address 11](#_Toc50382048)

[H.2. e-Hub access 11](#_Toc50382049)

Application Overview

AEMO is conducting a trial to test the performance of new technologies under clause 7.3 of the Market Ancillary Services Specification (the VPP Demonstrations). The VPP Demonstrations are intended to test the ability of small-scale energy resources to be orchestrated to provide *frequency control ancillary services* within a region.

Complete this Application Form to apply to enrol in the VPP Demonstrations and to:

* classify loads as ancillary services loads; and
* aggregate two or more *loads* so they are treated as one *ancillary services load*,

in accordance with the *VPP Demonstrations FCAS Specification[[2]](#footnote-3)* and the terms and conditions applying to the VPP Demonstrations.

If you wish to apply to classify a load as an *ancillary service load* to aggregate two or more loads but not as part of the VPP Demonstrations, please use the Application for Registration as a Market Ancillary Service Provider[[3]](#footnote-4) and Classification of Load or Application for Registration as a Customer in the NEM[[4]](#footnote-5).

For help completing your application, see Application Guide – NEM – VPP Demonstrations Enrolment[[5]](#footnote-6) on the AEMO website[[6]](#footnote-7)*.*

Direct any questions regarding your application to the AEMO Registration Team email: VPPEnrolment@AEMO.com.au.

# Enrolment Scenario

Please select the appropriate option from the list below.

|  |  |
| --- | --- |
| [ ]  Scenario 1 Initial Enrolment | The Applicant is applying to initially enrol in the VPP Demonstrations to:* classify *load* in a region with a technology to provide *market ancillary services*; and
* aggregate two or more *loads* in a region so they are treated as one *ancillary services load.*

You can only aggregate ancillary service loads controlled by the same technology types (switching control or variable control).This applies if the Applicant is applying to initially enrol in the VPP Demonstrations in respect of existing aggregated *market ancillary service loads* in a region.This also applies if an existing VPP participant is applying to enrol in the VPP Demonstrations with a new VPP consortium.(Complete ALL sections) |
| [ ]  Scenario 2 New Region with Enrolled Technology  | The Applicant is already enrolled in the VPP Demonstrations with a technology in one region and is applying to classify and aggregate *loads* to provide *market ancillary services* in a new region with the same technology to provide *market ancillary services*.(Complete sections A, B, D, E, F, G) |
| [ ]  Scenario 3 New Technology or New Services in an Enrolled Region  | The Applicant is already enrolled into the VPP Demonstrations with a technology in a region and is applying to * use a new technology type in that region to classify and aggregate *loads* to provide *market ancillary services; or*
* register additional *market ancillary services* in that region with that technology.

(Complete sections A, B, D, E, F, G) |
| [ ]  Scenario 4 Amend Loads | The Applicant is enrolled in the VPP Demonstrations with a technology in a region and is applying to:* classify additional *loads* in that region with that technology; and
* aggregate theadditional *loads* so classified,

which would increase the total aggregated *market ancillary service load* of the Applicant in that region in respect of that technology by one or more whole MW above the previously approved aggregation. (Complete sections A, B, E) |

# Application Details

## Applicant details

|  |  |
| --- | --- |
| Entity Name: |       |
| Trading Name: |       |
| ABN:  |       | ACN:       |
| Registered Category: | [ ]  Market Customer | [ ]  Market Ancillary Service Provider |
| Current Participant ID: |       |

## Declaration

The Applicant is applying to enrol in the VPP Demonstrations to:

* classify loads in a region with a technology to provide *market ancillary services*; and
* aggregate two or more loads in a region so they are treated as one *ancillary services* load,

in accordance with the terms and conditions applying to the VPP Demonstrations as set out in Section G of this Application Form.

The Applicant authorises AEMO to contact any organisation named in this Application and any attachment to this Application, any Jurisdictional Regulator, and any other party AEMO deems relevant for the purposes of verifying the contents of this Application and to enable AEMO to satisfy itself that the Applicant is of sufficient standing to meet its obligations under the NER, including any prudential and other requirements established in accordance with the NER.

I, <Full Name>, <Position>, declare that I am authorised by the Applicant to submit this Application on the Applicant's behalf and certify that the contents of this Application and any further submissions are true and correct.

|  |  |  |  |
| --- | --- | --- | --- |
| Signature: |  | Date: | 7/09/2020 |

When your application is complete, print, sign (please use your written signature as digital signatures are not accepted), scan then send your scanned copy to the AEMO Registration Team email: VPPEnrolment@aemo.com.au.

# Contact Details

You must provide contact details to assist with communication between AEMO and your organisation. Provide contact details for your head office and all relevant personnel.

## Head office details

|  |  |
| --- | --- |
| Office Name: |       |
| Street address: |       |
| State: |  | Postcode: |       |
| Postal address: |       |
| State: |  | Postcode: |       |
| Phone: |       |
| Email: |       |

## Personnel contacts

Please provide details for the following contacts.

| Mandatory contacts |
| --- |
| Enrolment: | Name: |       | Position: |       |
|  | Email: |       |
|  | Phone: |       | Mobile: |       |
|  |
| Frequency control ancillary service: | Name: |       | Position: |       |
|  | Email: |       |
|  | Phone: |       | Mobile: |       |
|  |
| IT Security Contact:(Initial enrolment only) | Name: |       | Position: |       |
|  | Email: |       |
|  | Phone: |       | Mobile: |       |

# VPP Details

## Description of VPP

Please provide a brief description of the VPP, the technology utilised and how the VPP will be operated.

|  |  |
| --- | --- |
| Details: |       |

## VPP consortium member details

If the Applicant is collaborating with a third party to manage or orchestrate the VPP fleet, or to submit data to AEMO, you are considered a VPP consortium for the purposes of this Application. Please provide details of the third party in the following table.

Are you applying for a new consortium?

[ ]  Yes [ ]  No

|  |
| --- |
| Third party VPP coordinator |
| Entity Name:       | ABN:       |

## Data and cyber security obligations

If the Applicant is nominating and authorising a third party to submit any data to AEMO as set out in the *VPP Demonstrations Data Specification*[[7]](#footnote-8), please provide details for the nominated third party below.

|  |
| --- |
| Third party data transfer provider |
| Entity Name:       | ABN:       |

The Applicant and any third party listed in sections D.2 and D.3 must each complete the Cyber Security questionnaire[[8]](#footnote-9) prior to the Applicant’s enrolment in the VPP Demonstrations.

A Cyber Security questionnaire is only required to be completed and submitted to AEMO once, unless it needs to be updated.

Please confirm whether this questionnaire has been completed and submitted with this Application Form to AEMO.

|  |  |
| --- | --- |
| Role  | Cyber security questionnaire completed and submitted with this application form |
| Applicant | [ ]  Yes[ ]  No, previously provided |
| VPP coordinator | [ ]  Yes[ ]  No, previously provided |

# Information on Market Ancillary Service Loads

## Ancillary service load identification

Are you applying for:

* Scenario 1 – initial enrolment; or
* Scenario 2 – new region with enrolled technology

[ ]  Yes You will require a new VPP ID for each region. Please provide details in the table below.

|  |  |
| --- | --- |
| Item | Details |
| Proposed VPP ID: |       |
| Proposed VPP ID name: |       |

[ ]  No Please provide an existing VPP ID:

Are you applying for:

* Scenario 1 - initial enrolment; or
* Scenario 2 - new region with enrolled technology; or
* Scenario 3 - new technology or new services in an enrolled region.

[ ]  Yes You will require a new dispatchable unit identifier (DUID) for each region or each technology. Please provide details in the table below.

|  |  |  |
| --- | --- | --- |
| Item | DUID 1 Details | DUID 2 Details |
| Proposed dispatchable unit identifier (DUID): |       |       |
| Proposed DUID name: |       |       |
| Region: |       |       |

[ ]  No Please provide existing DUID(s) if available. DUID 1:       DUID 2:

## Market ancillary service information

### Market ancillary service details

Please provide details of the *market ancillary services* that the applicant is seeking approval to provide using the table below.

Note: For contingency Frequency Control Ancillary Services (FCAS) relating to the VPP Demonstrations, the minimum and maximum enablement levels will be 0 MW and the maximum lower and upper angles will be 90 degrees.

| FCAS | DUID 1 | DUID 2 |
| --- | --- | --- |
|  | Serviceprovided (Y/N) | Switchingcontroller (Y/N[[9]](#footnote-10)) | Maximum marketancillary servicecapacity (MW) | Serviceprovided(Y/N) | Switchingcontroller(Y/N9) | Maximum marketancillary servicecapacity (MW) |
| Fast Raise Service(RAISE6SEC) | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       |
| Fast Lower Service(LOWER6SEC) | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       |
| Slow Raise Service(RAISE60SEC) | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       |
| Slow Lower Service(LOWER60SEC) | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       |
| Delayed Raise Service(RAISE5MIN) | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       |
| Delayed Slower Service(LOWER5MIN) | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       | [ ]  Yes[ ]  No | [ ]  Yes[ ]  No |       |

### Data submission for ancillary service loads

To classify *loads* as *ancillary service loads* and aggregate two or more *loads* so they are treated as one *ancillary services load*, please submit completed data lists of the *ancillary service loads* via AEMO’s VPP Demonstrations Application Programming Interface (API). This could include adding additional connection points, removing connection points or amending the details of the *ancillary services load* at a connection point. Please refer to the Guide to VPP Demonstrations APIs[[10]](#footnote-11) and *VPP Demonstrations Data Specification[[11]](#footnote-12)* for data submission via APIs.

Complete lists of data required for enrolment include:

* an NMI and Device Data list.
* a Frequency Injection Test Data (FITD) list[[12]](#footnote-13).

In the case that APIs are not ready at the time of VPP Demonstrations launch, please refer to section 1.2.1(2) of the Application Guide – NEM – VPP Demonstrations Enrolment[[13]](#footnote-14).

# Information on Control Equipment

Are you applying for a new technology (switching or variable) or for a new region with an enrolled technology?

[ ]  Yes Please complete this section.

[ ]  No

## Determination of ancillary services information

How was the *ancillary services* information determined? Please provide details where appropriate.

[ ]  Using *market load* design parameters

[ ]  Based on services previously provided under an *ancillary services* agreement

[ ]  Using test results

[ ]  Using the mathematical modelling of the plant

[ ]  Other (please describe)

|  |
| --- |
|       |

## Controls, communications and telemetry information

### Facilities to receive enablement instructions

Please describe the *facilities* installed to receive instructions from AEMO’s market systems for the enablement of each *ancillary service*.

|  |  |
| --- | --- |
| Details: |       |

### Control facilities

Please describe the control *facilities* installed for each ancillary service in accordance with the *Market Ancillary Service Specification[[14]](#footnote-15)* (MASS) or VPP Demonstrations FCAS Specification[[15]](#footnote-16), including communications and telemetry, where applicable.

For example, are the contingency services to be provided by feedback systems or under-or-over-frequency relays? Are the contingency services to be provided by variable controllers or switching controllers? Is the plant controlled from a location other than the plant to provide these services?

|  |  |
| --- | --- |
| Details: |       |

### Loads with switching controllers

Please identify any loads with switching controllers and the proposed frequency deviation setting of the switching controllers, in line with the frequency settings specified in Table 3 and Table 4 of the *MASS*.

|  |  |
| --- | --- |
| Details: |       |

### Monitoring and recording facilities

Describe the monitoring and recording *facilities* installed for each ancillary service in accordance with the MASS or *VPP Demonstrations FCAS Specification*, including communications and telemetry, where applicable.

For example, what is the sampling interval of active power and frequency records?

|  |  |
| --- | --- |
| Details: |       |

### Test data

For each controller type (e.g. battery system controller model, load control model, etc.), provide test data that demonstrates the provision of the services applied for.

* Test data should be provided for each category of service applied for (fast, slow and/or delayed, raise and/or lower as applicable)
* For each category of service applied for:
	+ test data should be provided showing the response to frequency deviations for at least three operating points to determine the maximum ancillary service capacity that can be registered,
	+ test data of the power flow and frequency should be on a common time scale,
	+ the resolution of the data should conform to the MASS or be agreed by AEMO under the *VPP Demonstrations FCAS Specification*, and
	+ if the controller allows the reversal of power (e.g. battery systems), the above tests should be repeated to demonstrate performance under reversal of power.
* Data from the frequency injection test on every battery system model and the VPP wide test described in the *VPP Demonstrations FCAS specification* is to be provided. Please confirm if any of the tests below have already been completed.

[ ]  FITD-Device: Frequency injection test on every battery system model

[ ]  FITD-DUID: VPP wide test (frequency injection or frequency dead-band adjustment) for all controller types

|  |  |
| --- | --- |
| Details: |       |

# Terms and Conditions

1. Under clause 3.8.3(e) of the National Electricity Rules and clause 7.3 of the *MASS*, the Applicant’s enrolment in the VPP Demonstrations, and AEMO’s approval of the classification and aggregation of *loads* specified in accordance with Section E.2.2 of this Application Form as one or more *ancillary services loads* is subject to the following terms and conditions.
	1. The VPP Demonstrations will commence on 31 July 2019 (Commencement Date) and continue for a minimum of 12 months from the Commencement Date, unless terminated earlier under clause G1.4.
	2. AEMO may, in its complete discretion, extend the term of the VPP Demonstrations and will notify the Applicant of any such extension within three months of the end of the VPP term under clause G1.1 or the end of an extended term under this clause G1.2.
	3. The Applicant’s enrolment in the VPP Demonstrations will terminate on the earlier to occur of
2. the end of the VPP Demonstrations term under clauses G1.1, G1.2 or G1.5;
3. the Applicant:
	* 1. failing to provide data to AEMO in accordance with the Data Specification[[16]](#footnote-17); or
		2. otherwise breaching a term or condition; and
		3. failing to rectify that breach to AEMO’s reasonable satisfaction within 30 days of receiving written notice from AEMO;
4. AEMO providing written notice to the Applicant that, in AEMO’s view, the Applicant’s continued participation in the VPP Demonstrations creates an unacceptable risk to cyber security to AEMO or other participants in the National Electricity Market (NEM) or the reliability or security of the power system; or
5. the Applicant informing AEMO in writing that it will no longer to participate in the VPP Demonstrations.
	1. The VPP Demonstrations will terminate effectively immediately on notice from AEMO if:
6. required by law or regulation, or a court or legal tribunal with competent jurisdiction; or
7. AEMO forms the view that the VPP Demonstrations causes an unacceptable risk to AEMO’s reputation or the reliability or security of the power system.
	1. On the termination of the VPP Demonstrations or the Applicant ceasing to be enrolled in the VPP Demonstrations:
8. the loads which are classified as ancillary services loads pursuant to this application and the *VPP Demonstrations FCAS Specification*[[17]](#footnote-18) will cease to be so classified; and
9. the loads which are aggregated in a region pursuant to this application will cease to be so aggregated; and
10. if the Applicant has separately applied to classify the loads subject to this application as ancillary services loads, and/or to aggregate those loads within a region (either before or after the Commencement Date), AEMO will treat the loads under that separate application and the *Market Ancillary Services Specification* as it applies to those loads, and not under in accordance with this VPP Demonstrations enrolment and application.
11. Data requirements
	1. The Applicant must provide to AEMO (either directly or through a third party nominated by the Applicant) the data as set out in the Data Specification[[18]](#footnote-19) in place from time to time.
	2. AEMO may amend the requirements in the Data Specification on giving 30 business days’ notice of the amendments to the Applicant.
	3. The Applicant acknowledges that:
12. the initial Data Specification in place on the Commencement Date is set out in the VPP Demonstrations Data Specification; and
13. AEMO intends to amend the initial Data Specification to require that certain data is submitted via API in accordance with one or more API Specifications; and
14. as at the Commencement Date, the API Specifications are currently under development; and
15. the API Specifications, once developed, will be reflected in amendments to the Data Specification in accordance with clause G2.3(b).
16. Consumer engagement
	1. The Applicant acknowledges that AEMO will consider a number of factors in assessing the VPP Demonstrations, including the experience of consumers at the *connection point* of *loads* that are classified as *ancillary services loads* and aggregated within a region pursuant to this application (VPP Consumers).
	2. The Applicant agrees to:
17. share with AEMO the marketing and contractual information (such as standard terms) provided to VPP Consumers (whether provided by the Applicant or a member of the Applicant’s VPP Consortium) in connection with the Applicant’s participation in the VPP Demonstrations;
18. implement systems and processes to monitor the experience of VPP Consumers; and
19. share information and insights gained through the monitoring in paragraph G3.2(b) with AEMO through providing a brief written report to AEMO in a manner that protects any personal information.
	1. Within 30 business days of receiving a request from AEMO (or at such later time as AEMO agrees acting reasonably), the Applicant will contact at least 75% of their VPP Consumers providing the relevant VPP Consumers with information about a consumer survey or other study regarding the VPP Consumer experience and outcomes to be conducted by a third-party service provider nominated by AEMO.
20. Use and Confidentiality of information
	1. The Applicant acknowledges that AEMO will use and share the data and information provided in connection with the VPP Demonstrations for the purpose of evaluating the VPP Demonstrations and for any other reason authorised by the Rules or law.
	2. Information received from the Applicant in connection with the VPP Demonstrations (including under these terms and conditions) is protected information under the National Electricity Law and AEMO will not disclose that information except as authorised by law.
	3. For the purposes of section 54(B) of the National Electricity Law, the Applicant:
21. consents to AEMO disclosing any information received from the Applicant in accordance with clause G3 of these terms and conditions to the Australian Renewable Energy Agency (ARENA) and the Energy Consumers Australia (ECA); and
22. will procure the consent of any third-party consortium member who provides information to AEMO in accordance with clause G3 of these terms and conditions to AEMO disclosing such information to ARENA and the ECA.
	1. On request from AEMO, the Applicant will provide AEMO with written evidence of the consent referred to in clause G4.3(b).
23. Declarations

Select from the following options if applicable:

[ ]  The Applicant confirms that the *load* being classified is a *load*.

[ ]  The Applicant confirms that appropriate arrangement(s) are in place with *retail customer(s*) at the relevant *connection point(s)*.

[ ]  The Applicant confirms that the *load* complies with the MASS or *VPP Demonstrations FCAS Specification*[[19]](#footnote-20).

[ ]  The Applicant confirms that there is no *generating unit* at the NMI that is registered, or required to be registered, as a *Generator.*

If one or more of the boxes above are not marked, please provide details why.

|  |  |
| --- | --- |
| Details: |       |

# IT Systems

## IT Notifications email address

It is important to receive AEMO notifications regarding IT changes or outages that may impact your business.

Please have your IT staff set up and maintain a group email address with an appropriate distribution list of members for this to occur (individual email addresses are not accepted).

|  |  |
| --- | --- |
| IT Notifications email address: | <e.g. AEMOIT@yourdomain.com.au> |

## e-Hub access

Note:Initial enrolments must complete this section.

For details regarding access to the e-Hub (using APIs), obtaining new certificates and submitting a Certificate Signing Request (CSR), see the [Guide to AEMOs e-Hub APIs](https://www.aemo.com.au/-/media/Files/Electricity/NEM/IT-Systems-and-Change/2018/Guide-to-AEMOs-eHub-APIs.pdf).

For API developers, see the [Guide to AEMO VPP Demonstration APIs](https://aemo.com.au/-/media/files/electricity/der/2020/guide-to-aemo-vpp-demonstration-apis.pdf?la=en).

Access to e-Hub is mandatory for Initial Enrolments.

Do you require e-Hub access? [ ]  Yes [ ]  No

|  |  |  |
| --- | --- | --- |
| Certificate: | [ ]  I have an AEMO certificate | [ ]  I need an AEMO certificate |

1. Digital signatures are not accepted. [↑](#footnote-ref-2)
2. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-FCAS-Specification>. [↑](#footnote-ref-3)
3. At <http://www.aemo.com.au/-/media/Files/Electricity/NEM/Participant_Information/Application-forms-and-supporting-documentation/Application-for-Registration-Market-Ancillary-Service-Provider.docx>. [↑](#footnote-ref-4)
4. At <http://www.aemo.com.au/-/media/Files/Electricity/NEM/Participant_Information/Application-forms-and-supporting-documentation/Application-for-Registration-as-a-Customer-in-the-NEM.doc>. [↑](#footnote-ref-5)
5. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Enrolment-Guide>. [↑](#footnote-ref-6)
6. At <http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Participant-information/New-participants/Application-forms-and-supporting-documentation>. [↑](#footnote-ref-7)
7. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Data-Specification>. [↑](#footnote-ref-8)
8. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Cyber-Security-Questionnaire>. [↑](#footnote-ref-9)
9. If not switching controller, it will be default as variable controller. [↑](#footnote-ref-10)
10. At <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/DER-program/Virtual-Power-Plant-Demonstrations>. [↑](#footnote-ref-11)
11. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Data-Specification>. [↑](#footnote-ref-12)
12. Please refer to section F.2.5 for details. [↑](#footnote-ref-13)
13. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Enrolment-Guide>. [↑](#footnote-ref-14)
14. At <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/Ancillary-services/Market-ancillary-services-specifications-and-FCAS-verification>. [↑](#footnote-ref-15)
15. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-FCAS-Specification>. [↑](#footnote-ref-16)
16. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Data-Specification>. [↑](#footnote-ref-17)
17. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-FCAS-Specification>. [↑](#footnote-ref-18)
18. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-Data-Specification>. [↑](#footnote-ref-19)
19. At <http://aemo.com.au/-/media/Files/Electricity/NEM/DER/2019/VPP-Demonstrations/VPP-Demonstrations-FCAS-Specification>. [↑](#footnote-ref-20)